Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1.   (Currently amended) Data processing device for performing a reconstruction of computed tomography (CT) data, wherein the computed tomography data is reconstructed from acquired CT data, the data processing device —comprising:

~~at least a partial spectrum acquired by using~~ a detector comprising energy resolving detector elements configured to acquire at least a partial spectrum;

_____, ~~wherein~~ a memory ~~is provided for storing~~configured to store at least one of the acquired CT data and the computed tomography data, and ~~wherein~~

_____a processor ~~is provided which is adapted~~configured to perform at least the following operation: determining a wave-vector transfer by using the at least partial spectrum; determining a reconstruction volume; rendering the reconstruction volume, wherein a dimension of the reconstruction volume is determined by the wave-vector transfer, ~~;~~wherein the wave-vector transfer represents

curved lines in the reconstruction volume; and rearranging the acquired CT data such that it corresponds to an acquisition along a desired source trajectory in the reconstruction volume.

2.   (Original) The data processing device of claim 1, wherein the acquired CT data is acquired during an acquisition wherein a source of radiation is displaced along a first source trajectory; wherein the acquired CT data are rearranged such that it corresponds to an acquisition along a second source trajectory in the reconstruction volume which is different to the first source trajectory; wherein the first source trajectory is a circle and the second source trajectory is a helix.

3.   (Currently amended) The data processing device of claim 1, wherein the processor is ~~furthermore adapted~~configured to perform a filtered back-projection along the curved lines in the reconstruction volume.

4.   (Original) The data processing device of claim 1, wherein the reconstruction volume is furthermore determined by two linear independent vectors of the rotation plane; and wherein the detector

is a two dimensional detector.

5.   (Original) The data processing device of claim 1, wherein

the rearranging of the acquired CT data such that it corresponds to

an acquisition along a helical source trajectory in the

reconstruction volume is performed by using John's Equation.

6.   (Original) The data processing device of claim 1, wherein

the rearranging of the acquired CT data such that it corresponds to

an acquisition along a helical source trajectory in the

reconstruction volume is performed by using the following equation:

$$q = \widetilde{q} + \frac{1}{2hc}\left[\frac{d_{min} + d_{max} - d}{d_{min} \times d_{max}}\right]aE,$$

with q being the wave-vector transfer, $\widetilde{q}$ being a virtual position

of an x-ray source, h being the Planck's constant, c being the

speed of light, α denoting an angular position of the x-ray source

in the rotational plane, E being an energy of a corresponding x-ray

photon, d denoting a distance from a scatter center of the

corresponding x-ray photon from the detector and d_{min} and d_{max} being

a beginning and an end of a region of interest of the curved lines

in the reconstruction volume.

7.   (Currently amended) A computer tomography (CT) apparatus

for examination of an object of interest, the computer tomography

apparatus comprising: a detector unit with an x-ray source and a

scatter radiation detector; wherein the detector unit is rotatable

around a rotational axis extending through an examination area for

receiving the object of interest; wherein the x-ray source

generates a fan-shaped x-ray beam adapted to penetrate the object

of interest in the examination area in a slice plane; wherein the

scatter radiation detector is arranged at the detector unit

opposite to the x-ray source with an offset with respect to the

slice plane in a direction parallel to the rotational axis; wherein

the scatter radiation detector includes a plurality of first

detector elements; wherein the plurality of first detector elements

are energy-resolving detector elements; and a data processor which

is adapted to perform at least the following operation: determining

a wave-vector transfer by using the spectrum acquired by using the

scatter radiation detector; determining a reconstruction volume;

wherein a dimension of the reconstruction volume is determined by

the wave-vector transfer; wherein the wave-vector transfer

represents curved lines in the reconstruction volume; and

rearranging the acquired CT data such that it corresponds to an acquisition where the x-ray source is displaced along a desired source trajectory in the reconstruction volume.

8.   (Original) The computer tomography apparatus of claim 7, wherein the scatter radiation detector is a two-dimensional detector.

9.   (Original) The computer tomography apparatus of claim 7, wherein the scatter radiation detector is arranged at the detector unit opposite to the x-ray source parallel to the slice plane and out of the slice plane with such an offset along the rotational axis such that the scatter radiation detector is arranged for receiving a scatter radiation scattered from the object of interest; and wherein the acquired CT data is acquired during an acquisition wherein the x-ray source is displaced along a first source trajectory; wherein the acquired CT data are rearranged such that it corresponds to an acquisition along a second source trajectory in the reconstruction volume which is different to the first source trajectory; wherein the first source trajectory is a circle and the second source trajectory is a helix.

10.   (Original) The computer tomography apparatus of claim 7, wherein the acquired CT data is acquired during a circular acquisition wherein a source of radiation is rotated around an object of interest in a rotation plane; wherein the processor is furthermore adapted to perform a filtered back-projection along the curved lines in the reconstruction volume; and wherein the reconstruction volume is furthermore determined by two linear independent vectors of the rotation plane.

11.   (Original) The computer tomography apparatus of claim 10, wherein the rearranging the acquired CT data such that it corresponds to an acquisition along a helical source trajectory in the reconstruction volume is performed by using the following equation:

$$q = \widetilde{q} + \frac{1}{2hc}\left[\frac{d_{min} + d_{max} - d}{d_{min} \times d_{max}}\right]aE,$$

with q being the wave-vector transfer, $\widetilde{q}$ being a virtual position of the x-ray source, h being the Planck's constant, c being the speed of light, α denoting an angular position of the x-ray source in the rotational plane, E being an energy of a corresponding x-ray

photon, d denoting a distance from a scatter center of the

corresponding x-ray photon from a detector including the scatter

radiation detector and d_{min} and d_{max} being a beginning and an end of

a region of interest of the curved lines in the reconstruction

volume.

12.   (Currently amended) Method of performing a reconstruction

of computed tomography (CT) data, wherein the computed tomography

data is reconstructed from acquired CT data comprising at least a

partial spectrum acquired by using a detector comprising energy

resolving detector elements, the method comprising the stepsacts

of: determining a wave-vector transfer by using the at least

partial spectrum; determining a reconstruction volume; and

rendering the reconstruction volume; wherein a dimension of the

reconstruction volume is determined by the wave-vector transfer;

wherein the wave-vector transfer represents curved lines in the

reconstruction volume; and rearranging the acquired CT data such it

corresponds to an acquisition along a desired source trajectory in

the reconstruction volume.

13.   (Original) The method of claim 12, wherein the acquired CT

data is acquired during an acquisition wherein a source of

radiation is displaced along a first source trajectory; wherein the

acquired CT data are rearranged such that it corresponds to an

acquisition along a second source trajectory in the reconstruction

volume which is different to the first source trajectory; wherein

the first source trajectory is a circle and the second source

trajectory is a helix; and wherein the detector is a two

dimensional detector.

14.   (Original) The method of claim 13, wherein the rearranging

the acquired CT data such that they correspond to an acquisition

along a helical source trajectory in the reconstruction volume is

performed by using the following equation:

$$q = \widetilde{q} + \frac{1}{2hc}\left[\frac{d_{min} + d_{max} - d}{d_{min} \times d_{max}}\right]aE,$$

with q being the wave-vector transfer, $\widetilde{q}$ being a virtual position

of an x-ray source, h being the Planck's constant, c being the

speed of light, α denoting an angular position of the x-ray source

in the rotational plane, E being an energy of a corresponding x-ray

photon, d denoting a distance from a scatter center of the

corresponding x-ray photon from the detector and d_{min} and d_{max} being

a beginning and an end of a region of interest of the curved lines in the reconstruction volume.

15. (Currently amended) Computer program <u>stored on a computer readable medium </u>for a data processor for performing a reconstruction of computed tomography <u>(CT) </u>data, wherein the computed tomography data is reconstructed from acquired CT data comprising at least a partial spectrum acquired by using a detector comprising energy resolving detector elements, wherein the computer program causes the data processor to perform the following operation: determining a wave-vector transfer by using the at least partial spectrum; determining a reconstruction volume; wherein a dimension of the reconstruction volume is determined by the wave-vector transfer; wherein the wave-vector transfer represents curved lines in the reconstruction volume; and rearranging the acquired CT data such that they correspond to an acquisition along a desired source trajectory in the reconstruction volume.